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ter, Contributions to the flora of Indiana, No. 5, and Experiments in germination of composites ; Cunningham, The Ericaceæ of Indiana, and Indiana's Gentianaceæ; Wright, Inarching of trees, and Notes on the cypress swamps of Knox County.

As President of the Michigan Academy of Science, Prof. V. M. Spalding delivered, some months since, an address on *A Natural History Survey of Michigan*, which has been issued in pamphlet form. His plea for the organization of such a survey is timely, and the results being reached in Wisconsin should make success reasonably certain if it were organized in the proper manner.

PETROGRAPHY AND MINERALOGY.

A New Edition of Dana's Mineralogy.[1] — The latest edition of Dana's *Text-Book of Mineralogy* is practically a new book. It is unquestionably the best text-book of modern mineralogy that has appeared. In its general make-up it resembles very closely the earlier editions of the book bearing the same title, but in its contents it varies widely from these. The entire book has been rewritten, and all of its parts have been brought quite up to date.

"In the chapter on crystallography, the different types of crystal forms are described under the now accepted thirty-two groups, classed according to their symmetry. The names given to these groups are based, so far as possible, upon the characteristic form of each, and are intended also to suggest the terms formerly applied in accordance with the principles of hemihedrism. The order adopted is that which alone seems suited to the demands of the elementary student, the special and mathematically simple groups of the isometric system being described first" (from author's preface). The discussion of crystallographic symmetry is remarkably simple. It should be clear to any student.

The section devoted to the explanation of the general principles of optics, and of the optical characters of minerals, is particularly welcome in an English text-book. All of the most important optical principles are expounded, the optical characteristics of the different crystal systems explained, and the methods used in determining their values are fully illustrated. This last-mentioned feature of the volume will be enthusiastically received by English-speaking teachers of mineralogy, since it embodies descriptions of methods heretofore available only in foreign text-books.

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[1] Dana, E. S. A Text-Book of Mineralogy, with an extended Treatise on Crystallography and Physical Mineralogy. New edition, entirely rewritten and enlarged. New York, John Wiley & Sons, 1898.

The descriptive part of the volume is essentially an abridgment of the sixth edition of Dana's *System of Mineralogy.*

Two excellent indices close the book. One is a general index, or index of topics, and the other an index to the mineral species discussed. The two occupy about twenty-two pages.

The volume constitutes an excellent introduction to modern mineralogy. It fills a want long felt by teachers who realize that the study of minerals is much more than a mere *description* of chemical compounds. This has long been understood on the continent of Europe, where the best mineralogical text-books have heretofore been published, and now, we are glad to say, it is being rapidly accepted as a truth in America; a fact due largely to the interest taken by American students in petrographical investigations. Professor Dana's text-book is the equal of any foreign text-book, either as a student's handbook of descriptive mineralogy or as an introduction to special works in petrography.

It is unnecessary to state that the treatment of all branches of the subject is accurate and as full as is desirable, since the author's name is a guarantee that the work is well done.

W. S. B.

Michigan Volcanics. — Clements[1] decribes a series of intrusive rocks from the Crystal Falls iron district in Michigan which he believes to be genetically connected. Embraced in the series are diorites, gabbros, norites, and peridotites. The diorites are intermediate in acidity. They vary in texture between granitic, ophitic, and micropegmatitic. Their plagioclase is andesine, but in addition to this feldspar they contain also considerable quantities of orthoclase. This mineral and quartz form the mesostasis. Brown and green hornblende are both present, the latter surrounding nuclei of the former. Both are regarded as primary. The mineralogical varieties of the rock recognized are: quartz-diorite, tonalite, quartz-mica-diorite, and mica-diorite. By the subordination of the plagioclase and an increase in the proportions of orthoclase and quartz present, the diorites pass into granites.

The gabbros and norites, like the diorites, contain more or less orthoclase and a large quantity of hornblende. This latter mineral

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[1] *Journ. of Geol.*, vol. vi (1898), p. 372.